

CASING RUNNING TOOL

CRT350 and CRT500



NATIONAL OILWELL VARCO

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The National Oilwell Varco® Casing Running Tool (CRT) introduces step change in the way casing is run today. By combining the functionality of field proven tools such as the Top Drive, Flush Mounted Spider (FMS), Fill-up and Circulation Tool and Hydraulic Single Joint Elevator, casing operations are now safer, faster, and more efficient. The CRT, which is connected directly to the Top Drive main shaft, simultaneously hoists and lowers casing, spins-in and makes up the casing connection. The NOV® CRT enables the driller to rotate, reciprocate, and circulate the casing string.

Safety

- Eliminates stabbing-board operations, less manual handling in the V-door and fewer safety hazards
- Power casing tong operations and work platforms have been removed, allowing for better ergonomics and work space around the well-center

Economics

- A reduced casing crew can run the casing, minimizing stand-by costs associated with weather or problematic well conditions
- The CRT pipe weight compensator substantially reduces the risk of damage due to cross-threading
- Utilizing the Top Drive to control make-up reduces thread damage during the complete make-up cycle

Well Improvements

- Greatly increases the possibility of setting casing at target depth, due to the ability to push, circulate and rotate the casing simultaneously
- Reduces the risk of stuck casing
- Ability to pressure test each connection

Efficiency

- Less equipment to rig-up; the CRT combines a single joint elevator, rigid link hoist and stabbing assembly, fill-up and circulation tool, and compensator in one assembly
- Single load-path design eliminates links
- The driller determines and controls the running/tripping speed, spin-in and make-up torques
- When running mixed strings, size of components can be changed within minutes through the twist lock design

Features CRT Compensator

- Employs a patented cushioned weight compensator which balances out the weight of CRT
- The CRT has a patented air operated compensator to enable soft stabbing, allow for thread compensation and minimizes the risk of thread damage

CRT Pipe Sensor

- The pipe sensor detects the casing coupling so slips will set automatically at the correct position, ensuring casing connection integrity

CRT Fill-up and Circulation Tool

- Fill-up tool enables fast change out of seal and guide elements when mixed strings are run
- Prevents spills of drilling fluids
- Reduces the risk of environmental incidents
- The new design Fill up and Circulate tool (FAC-tool) greatly reduces downtime due to FAC tool issues

Picking Up a Joint from the V-door

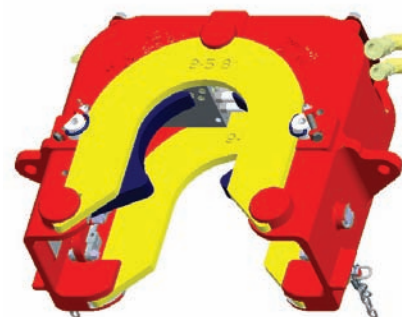
- The link tilt assembly will enable the CRT to pick up a new joint from the V-door.
- Maximum horizontal pick up 21 ft for the CRT500 with extended link tilt arms
- New design UX type hydraulic pick up elevator (9½" - 14") allows for simple and safe pick up and latch of new joint



CRT (complete unit)



H-SJH elevator for CRT350 and CRT500
Rating max [Tons / sTons] 4.5 / 5
Size [inches] 4½" - 9½"

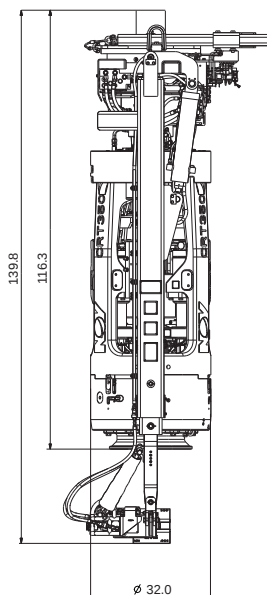
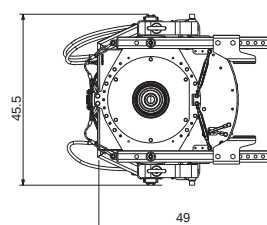


UX elevator for CRT500
Rating max [Tons / sTons] 4.5 / 5
Size [inches] 9½" - 14"

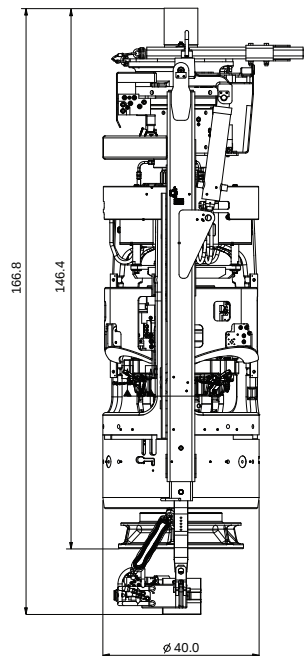
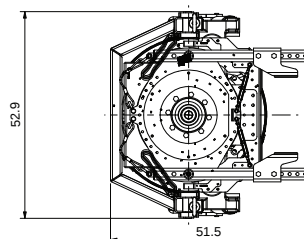
Technical Specifications

Description	CRT350	CRT500
API 8C Hoist Rating [sTon/Ton]	350 / 317	500 / 454
Casing Size	4½" to 9½"	4½" to 14"
Fill-Up and Circulation	4½" to 9½" circulation and fill-up (fill-up, circulate, and recovery over the full range)	4½" - 14.00" circulation and fill-up (fill-up, circulate and recovery over the full range)
Maximum Mud Circulation Pressure [psi/kPa]	up to 5,000 / 34,500 (size dep.)	up to 5,000 / 34,500 (size dep.)
Rotational speed [rpm]	0-20 (intermittent)	0-20
Weight (fully dressed, typical) [lbs/kg]	10,500 / 4,762	17,636 / 8,000
Maximum Push Down Force [lbs/kg]	20,000 / 9,072 (static)	20,000 / 9,072 (static)
Ambient Temperature Range [C]	-20° to +40°	-20° to +40°
Maximum Torque [ft.lbs@psi / Nm@kPa]	35,000 / 47,400	55,000 / 74,540
Shaft connection	6½" API Reg. RH (box) 7.750"OD	7½" API Reg. RH (box) 8.625"OD
Diameter of CRT body	32"	40"
Width of CRT assembly	44.3"	53.5"
Height	116.3" (compensator mid stroke, from shaft shoulder to CRT bell guide)	146.4" (compensator mid stroke, from shaft shoulder to CRT bell guide)
Height	139.8" (link arm fully in, from shaft shoulder to H-SJH)	166.8" (link arm fully in, from shaft shoulder to UX)
Compensator capacity@90 psi air supply [lbs / kg]	8,500 / 3,860	13,125 / 5,950
Link tilt tilt-out distance [ft / m]	15' / 4.5	21' / 6.4

CRT350 Dimensions



CRT500 Dimensions



Patent Numbers:

WO0052297
 EP1475512
 US2006005962
 US2002074132
 US6,443,241
 US6,527,493
 US6,691,801
 US6,637,526
 US6,938,709
 WO.03/025444
 WO.03/054338
 US6,845,814 B2
 US7,096,977
 US7,510,006
 US7,591,304

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